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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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See Page 184

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CHEMISTRY

Chlorophyll Wanting

Laboratory tests, including one using a chemical reaction rather than the human nose as an indicator, refute claims that chlorophyll has ability to deodorize.

► TESTS OF chlorophyll which refute claims for its ability to deodorize are reported by Dr. John C. Brocklehurst of the University of Glasgow and Stobhill General Hospital, Glasgow, in the *British Medical Journal* (March 7).

One of these tests gets away from reliance on the human nose as an indicator of chlorophyll action. In this test Dr. Brocklehurst used methylmercaptan gas, one of the substances contributing to the odor of the gas normally present in the lower bowel.

This gas was made to pass through a baffle of filter paper soaked in chlorophyll solution. Then it bubbled through tubes containing iodine. Mercaptan combines with iodine to form colorless hydriodic acid, so the time taken to decolorize a standard iodine solution could be taken as a measure of how much mercaptan was stopped by the chlorophyll with which the filter paper was soaked.

There was no difference in the time taken for mercaptan to go through water and chlorophyll solutions, including one commercially prepared for use on a wick to deodorize air. The chlorophyll did not re-

duce the amount of gas passing over to the indicator, Dr. Brocklehurst states.

Other tests, made with the human nose as indicator, showed that it did not remove the smell of mercaptan.

Some nose tests, on excreta from an incontinent patient, who was given chlorophyll tablets or pills on alternate three-day courses, also showed no difference in odor during the chlorophyll or non-chlorophyll periods. The person who did the smelling for these tests did not know which days the patient got the chlorophyll tablets.

Other tests, which many doctors and laymen can make on themselves, involved taking chlorophyll tablets every four or six hours for 24 hours before eating asparagus. The tablets did not prevent the asparagus odor from developing in the urine.

The odor of one drop of perfume, used in another test, persisted in the experimental jars for five months although all the concentrated chlorophyll solution it was put in had evaporated in 14 days.

A test with onions had to be abandoned after 24 hours because the smell of the chlorophyll-treated onions was so offensive.

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ASTRONOMY

Moon Has Argon "Air"

► THE MOON does have a breathable, though very thin, atmosphere. This atmosphere, or "air," consists of slight amounts of argon and perhaps other noble gases, and there are at least a few breaths of it, Dr. Harlow Shapley of Harvard College Observatory states.

This very thin atmosphere would not, he warned, be very "sanitary" to breathe. The argon in the moon's "air" comes from radioactive decay of a potassium isotope in rocks brought to the surface by bombardment of myriads of meteors.

Argon makes up about one percent of the earth's atmosphere, and is believed to have come from the spontaneous radioactive decay of a form of potassium over a long period of time. Volcanic action, however, hurls many more potassium-containing rocks to the surface where decay products are released.

A little of the moon's argon might escape the moon's surface entirely, Dr. Shapley said, but most of it, being quite heavy and not active chemically, would probably stay to make an extremely thin blanket.

Lighter elements, such as hydrogen, nitrogen or oxygen, released as a result of

meteoric bombardment of the moon are either so light they would escape into space, or else they might, as they are formed, combine with other materials in the rocks.

Other noble gases, elements such as krypton and xenon that are very inactive chemically, might also make up part of the moon's atmosphere, Dr. Shapley believes.

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MEDICINE

Leukemia Is Mimicked By Milder Blood Disease

► ONE-FIFTH OF patients thought to have one kind of leukemia, often called blood cancer, may actually be suffering from another and comparatively non-malignant blood disease.

Patients with the non-malignant blood disease have a life expectancy of from five to 25 years, compared to the three to five years for those with chronic myelogenous leukemia.

This hopeful finding for some supposed leukemia patients comes from research announced by the American Cancer Society

and performed at the University of Chicago under the direction of Drs. Matthew Block and Leon Jacobson.

The non-malignant blood disease is called myeloid metaplasia. It sometimes is caused by tuberculosis or cancer but sometimes occurs as a primary disease. Symptoms include fever, spleen and liver enlargement and tendency to bruise easily and bleed profusely. These mimic the symptoms of leukemia.

Treatment of the two conditions is entirely different, so definite diagnosis is important, the Chicago doctors stress. The diagnosis, they found, can be made by microscopic examination of a bit of spleen removed for this purpose.

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AERONAUTICS

Helicopters Now Carry Supplies to Front Lines

► MOSQUITO-TAILED HRS helicopters are making it difficult for Chinese Reds to recapture their bunkers in Korea after hard-hitting Marines have blasted them out, the Sikorsky Aircraft Co., Bridgeport, Conn., reports.

The helicopters carry construction supplies to advancing Marines, thus allowing the Leathernecks to rebuild and occupy battered bunkers before the Reds can counter attack.

Timbers are presawed to the proper length behind the front line. They are loaded into helicopters along with empty gunny sacks that later will serve as emergency sand bags. Timber and sacks are dropped to advancing Marines when a covey of Communists has been flushed from a bunker.

The technique has been so effective that it has been made a standard Marine combat maneuver.

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HORTICULTURE

Cherry Blossoms to Bloom Without Sprays

► CHOOING CHERRY blossom time in Washington will be left up to mother nature this spring, following two seasons of trying to retard early blossoming with hormone sprays.

Horace Wester, technical adviser to the National Capital Parks, has reported that he does not plan to use hormone treatments on the famous trees if they threaten to bloom too early for the Cherry Blossom Festival.

Past attempts to hold back blossoming with hormone sprays did not prove effective enough to warrant their large-scale use again, Mr. Wester said, although the chemicals do show some effects on younger plants.

The Cherry Blossom Festival comes a week later this spring, April 8 to 12, to avoid conflicting with Easter week.

Science News Letter, March 21, 1953

NUTRITION

Limited Protein Diet

New kind of reducing diet, now being tested for effectiveness and safety, allows patients to eat all sweet, fat and starchy foods desired, restricting only protein intake.

► A NEW kind of reducing diet is being tested on some very fat people at the Hospital of the Rockefeller Institute for Medical Research, New York.

Exact details have not yet been worked out and the doctors testing it are not yet ready to recommend it indiscriminately. It might be harmful to people under certain conditions.

If it proves safe and effective, however, it will be popular. Those on the diet will not feel hungry or weak. They will be able to eat all the sweet and fat and starchy foods they want.

The point is, they will not want much of these fattening foods. In fact, they will not have the appetite for eating too much of any food.

The diet will restrict those following it in the amount of protein they can eat. Only a small amount of foods such as meat, milk, eggs, fish and poultry will be allowed. Even the high protein vegetables such as peas and beans will be limited.

The new diet, now under trial as a reducing diet, is based on the discovery that when the amount of protein is reduced, appetite goes down and weight falls off. This discovery was made by Drs. Vincent P. Dole, Lewis K. Dahl, Irving L. Schwartz, George C. Cotzias, Jorn H. Thaysen and Cecilia Harris.

The finding, reported in the *Journal of Clinical Investigation* (Feb.), was made on patients with high blood pressure. Patients put on the rice-fruit diet developed by Dr. Walter Kempner at Duke University, Durham, N. C., rapidly lost weight. During this period of rapid weight loss, they took a reduced number of calories, in other words, ate less. But when their weight stabilized at a new, low level, they began to take in about as many calories as before, even though by that time, after four months on the rice-fruit diet, they were "heartily bored with the menu."

Seeking the dietary factor responsible for this, and also its importance in treating high blood pressure, led to discovery of the appetite-decreasing effect of the diet.

So far as the blood pressure was concerned, salt, or rather the sodium in salt, was the important factor. When this was restricted to a very low level, blood pressure was reduced even when the protein intake was varied ten-fold.

When the protein was reduced, however, there was always a reduction in weight and when the protein was increased there was always an increase in weight.

The amount of protein in the diet was low, but not too low for good health. The

scientists point out that "a large number, perhaps a majority, of the people in the world live, work and reproduce on diets that are at least as restricted."

For growing children, patients with liver disease or after operations, for alcoholics and perhaps for many others this diet might be too restricted.

Why the low protein diet reduces appetite and weight is explained by the theory that with reduced protein intake, there is a reduced rate in the body's metabolic processes for handling protein. All the metabolic rates then get out of balance and some chemicals from other foods get into a state of relative surplus.

The appetite is therefore depressed and the "inventory" of these other chemicals is allowed to shrink until a new steady state is reached. This takes several months. After that the appetite returns to a point where there is a balance of food intake with expenditure. In other words, the person then eats only as much as he needs to replace the energy he uses.

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• RADIO

Saturday, March 28, 1953, 3:15-3:30 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

W. H. Shepherd, vice-president of the Arkansas Power Company, Frank W. Cantrell, managing director of the Arkansas Economic Council, and Arthur Emmerling, director of the Arkansas Resources and Development Commission, discuss "Resources in Arkansas."

SURGERY

New Map of Head Aids Brain Tumor Spotting

► A NEW map of the head for better localization of brain tumors by the radioactive isotope method has been constructed by Drs. Alexander Langer and Robert Loevinger of Mount Sinai Hospital, New York.

Not only brain tumors but other diseased conditions of brain tissue due to circulatory deficiency might be detected, they think, by use of their map and technique.

With their method, reported in *Science* (March 7), mathematical computations and the map are used instead of the "skill and experience" of the doctor in localizing the brain tumor. By injecting radioactive material into the veins of 13 patients who had no brain disease, they were able to map the average pattern of isotope distribution for the normal head. This is used for comparison with maps made of patients with brain tumors.

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SEVEN-DAY-OLD TWINS—These two tiny cubs, born at the National Zoological Park in Washington, have a grandfather that was an Arizona puma and a grandmother that was a mountain lion.

CHEMISTRY

Recognize Chemist's Aid

► "SUZIE Q," chemist's aid, has been officially recognized. In a reversal of the Patent Examiner's stand, the U. S. Patent Office Board of Appeals recently allowed claims in an application concerning a "Method of Determining the End Point of a Titration," developed by Dr. Fred W. Jensen, head of the chemistry department at Texas A. and M. College, College Station, Texas.

The device, popularly called the "Suzie Q," is a high-frequency analysis aid which gives a highly sensitive reading of molecular change when a known chemical is added to an unknown solution.

Using a magnetic field coil, the "Suzie Q" frees the scientist from the necessity of actually touching the solution to be analyzed, thereby greatly increasing simplicity, accuracy and range of usage.

A test-tube or continuous conductor for the test solution is thrust into or through the oscillator coil which sets up a molecular orientation and ionic motion within the solution. This orientation and the power it uses are calibrated on a scale.

Then a known chemical is added to the unknown, changing its chemical nature and altering the magnetic field. This change affects the magnetic field and alters the power requirement, which in turn is registered on the calibrated scale.

So sensitive is the mechanism that it can be adapted to show clearly the difference in impurity content of two batches of double-distilled water.

At the other end of the scale of uses, it could be adjusted to select undamaged fruit from that which has suffered frost damage. It is now being used for maintenance of purity standards of production chemicals and as a method for determining proper saturation in a mixing tank.

Dr. Jensen received help and encouragement in his development of the "Suzie Q" from Dr. A. L. Parrack of the college staff, the Texas Engineering Experiment Station and the Texas A. and M. Research Foundation. The Foundation also helped him in securing acceptance of claims in the patent office.

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MEDICINE

Advice During Pregnancy

► YOUNG WOMEN who have heart disease can safely have babies in most cases. But they, more even than other women, must consult a doctor early in pregnancy and follow his instructions carefully.

Women with heart disease who get into serious trouble during pregnancy are usually those who postpone going to doctor or clinic until the pregnancy is nearly over.

"Don't wait until you are in trouble before getting help," warns the American Heart Association in its booklet, Heart Disease and Pregnancy.

Many women with heart disease worry about whether they will have heart failure while giving birth to their babies. This is not likely to happen, the heart association says. By the ninth month of pregnancy the heart has usually adjusted itself to the demands the body makes on it and can carry safely through delivery of the baby.

Four dangers the pregnant woman with heart disease should guard against are: 1. Overfatigue. 2. Overweight. 3. Infection. 4. Tight clothing.

Most of the rules for pregnant women with heart disease are the common sense rules that apply to all pregnant women, but the woman with heart disease needs to follow them more carefully. And she needs to see her doctor oftener, so that he can detect the earliest sign of any trouble and take steps to correct it. He probably will want to see her every two weeks and in some cases every week instead of once a month during the pregnancy.

Women with heart trouble must also plan for more rest after the baby is born as well as before. They will need to go on watching their weight and diet and to take care of any illness even if it does not seem to be a serious one.

Heart disease is almost never inherited, so there is no need to worry about the baby having it just because mother does. But the child's doctor should know if mother has had rheumatic heart disease, so he can advise about protecting the child.

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ASTRONOMY

New Asteroid Found In Northeastern Sky

► A NEW stellar object with an unusual orbit, probably an asteroid, has been spotted in the northeastern sky.

Moving very rapidly, the object was first located in the constellation of Ursa Major, the larger bear, of which the familiar Big Dipper is a part. Its extremely fast motion brought it into Canes Venatici, or the hunting dogs, by March 12.

The object is of the ninth magnitude, too faint to be seen with the unaided eye. It was first observed at 3:34 a.m. EST on March 9 by Dr. Albert G. Wilson of the California Institute of Technology and Mt. Wilson and Palomar Observatories. He found it on photographic plates taken as part of the sky survey being sponsored by

Palomar Observatory and the National Geographic Society.

When discovered, the object's position was: right ascension, 11 hours, 14.7 minutes; declination, plus 37 degrees, 12 minutes. It was then about 30 degrees north of the ecliptic, which represents the sun's apparent annual path on the celestial sphere.

Its daily motion at the time it was found was: plus 17 minutes, 12 seconds in right ascension; plus 3 degrees, 16 minutes in declination.

Dr. Wilson has previously spotted other objects in the sky, including the first comet to be found last year, Comet 1952a.

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CHEMISTRY

Chlorophyll Possible From Lifeless Earth

► THE CHEMICAL basic to life, chlorophyll, could have been spontaneously created in the lifeless world of two billion or more years ago, experiments by Ohio State University chemists indicate.

In tests set up to re-create conditions that probably existed before life appeared on earth, the chemists found that two common gases and water, when passed over heated silica produce a chemical with the same basic structure as chlorophyll.

Under the direction of Dr. William M. MacNevin, the scientists passed carbon dioxide, ammonia and water over a heated silica tube, representing the hot rocks of the earth's early days. This produced molecules of porphyrin, which have a basic structure like that of chlorophyll.

Chlorophyll is the highly complex chemical by which green plants utilize carbon dioxide and the energy of sunlight to manufacture the food necessary for life.

In another experiment re-creating conditions of the earth's youth, the scientists sent 100,000 volts of "artificial lightning" through an atmosphere of marsh gas (methane) and water vapor. This resulted in the formation of a resinous substance so complex chemically that its structure could not be analyzed.

Artificial lightning was used in this investigation of the young earth's probable chemistry, because of evidence that lightning was almost continuous then, Dr. MacNevin said.

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TECHNOLOGY

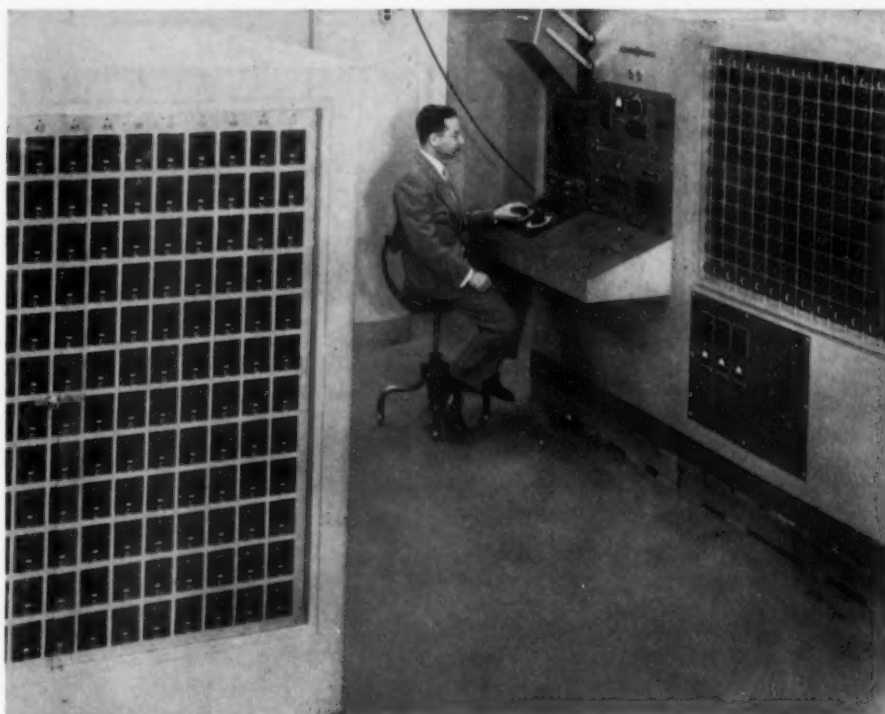
Develop New Process To Flameproof Fabrics

► IMPROVED FLAMEPROOFING of cotton fabrics, using a new process known as "THPC," has been developed by the U. S. Department of Agriculture.

THPC applied to cotton fabrics by conventional methods of processing gave excellent flameproofing qualities. Cloth treated by the THPC process should be especially useful for curtains, draperies, upholstery, bedding, and other household items. Wilson A. Reeves and John D. Guthrie of the Bureau of Agricultural and Industrial Chemistry's Southern Regional Laboratory in New Orleans developed the new process.

Two chemicals used in this new flameproofing process are a phosphorus compound and urea, a common industrial chemical. Another is "methylolmelamine," a substance widely employed to make fabrics creaseproof. The process should cost only slightly more than some of the less permanent flameproofing processes now in commercial use. THPC is made from inexpensive chemicals by a technique feasible for commercial production.

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RIGHT MAN FOR RIGHT JOB—The two and one-half ton electronic computer shown here may some day help Army psychologists fit recruits into the right job.

PSYCHOLOGY

Machine Tests Tests

► A MACHINE has been created in Washington to do much of the routine brainwork in testing new Army psychological tests.

Scientists using the "robot psychologist" at the Army's Personnel Research and Procedures Division would not speculate on the machine's ultimate effect upon Army life. But it may mean future recruits will be happier in the Army because they will be doing the right job.

Basic plans of the robot were drawn up by Department of Defense psychologist Dr. Richard H. Gaylord. Dr. Gaylord's plans were turned over to General Electric engineers for development and production.

The robot is highly complex and specialized. In the same category as other electronic "brains" that have "memories," the machine helps psychologists evaluate new tests that have been drawn up to reveal what special abilities each man has.

Extremely simplified, this means that the machine would show the trained psychologist which of four mechanical-ability tests does the best job of revealing a recruit's mechanical ability.

It can do this, however, only after the tests have been given to a group of men who are assumed to have high mechanical ability. Data obtained from the actual testing then are fed into the machine for evaluation.

The machine, through clusters of spots it throws on a tube similar to 16-inch television picture tubes, shows which test best samples the person's trait—or "factor," as the psychologists call it—under study.

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MARINE BIOLOGY

Whales Tracked by Ultrasonic Pulses

► MOBY DICK, the great white whale, could not elude modern British whalers, armed with ultrasonic "whale-finders," as he did the persistent Captain Ahab.

British whaling expeditions to the Antarctic this season are reported to be using ultrasonic sound pulses to track down the leviathans. Employing the Asdic principle perfected during the war for detecting enemy submarines, ultrasonic pulses sent out from the ship strike whales and rebound to the ship, revealing the direction and distance away of the sea-going mammals.

The ultrasonic whale-finder can follow a whale's course under water for distances up to 2,000 yards, reported the U. S. Fish and Wildlife Service. Helicopters may also be used to locate whales this season.

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PHYSICS

Grow Germanium Crystals

Electronic temperature controls help to lick problem of growing germanium crystals having exactly the desired shape for use in transistors.

► GROWING PRECIOUS crystals of germanium is as touchy as growing hothouse orchids. Both depend largely upon careful temperature control.

To lick the temperature problem, engineers at Minneapolis-Honeywell Company got together with scientists at the Massachusetts Institute of Technology. They created an electronic temperature control system to supervise the heat aspects during the critical crystal-growing stage.

The temperature must be just right if the right kind of crystal is to emerge from the molten metal. The whole process must be carefully handled if a crystal that resembles a quarter-pound stick of butter is the form desired. Otherwise, a six-inch-long carrot-like crystal may be the result.

Germanium is the metal of which transistors are made. Transistors are rugged, revolutionary and pea-sized devices that may replace the fragile vacuum tube such as you will find in your radio. Transistors do a better job than vacuum tubes, can withstand rough treatment and are more efficient.

They now are going into smaller and lighter hearing aids and may wind up eventually in your television set.

Lead mines in Missouri now supply the biggest part of commercial germanium to American manufacturers. It comes as an

oxide that reacts with hydrogen to yield germanium powder.

The powder is melted and heated to about 1,800 degrees Fahrenheit as the first step in the crystal-forming process. Then it is cooled about 90 degrees and a small "seed" of germanium is touched to the surface of the molten metal. A crystal begins forming on the seed. As it forms, the crystal is drawn slowly from the molten metal.

Scientists at Bell Telephone Laboratories get a crystal having roughly a square cross-section by watching the temperature closely and by rotating the crystal slowly as it forms. If this is not done, the crystal may grow lopsided.

A single crystal of germanium is desirable for transistors because it makes the transistors interchangeable. That is, one transistor can be substituted for another in a given circuit.

The first transistors were made of many small crystals of germanium stuck together. But sometimes the manufacturing control was not accurate enough to permit the crystals to be switched around in the circuit without redesigning the circuit somewhat.

Scientists discovered this was because germanium was in its "polycrystalline" form. By using a large single crystal, scientists got around the problem.

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GENERAL SCIENCE

Fourth Science Fair

► THE ATOMIC city of Oak Ridge, Tenn., whose very existence was a military secret for two years during the war, is preparing to play host to young scientists from all over the country when they come to the Fourth National Science Fair to be held there on May 7, 8 and 9.

The teen-age students who come out on top in local science fairs will be guests of the Oak Ridge Institute of Nuclear Studies and the Union Carbide and Carbon Corporation.

The boys and girls will set up their exhibits in the American Museum of Atomic Energy alongside world-famous mementos of the history of atomic energy. They will come from all over the nation, from science fairs held from California to Connecticut, and will have earned their trips by winning out against thousands of their fellow students in local fairs sponsored by scientists, educators and home town newspapers.

While at Oak Ridge, the finalists will be permitted to see many of the atomic instal-

lations, some of which have not been shown to the public before. Much of the area, of course, is still behind security walls.

The finalists, however, will be able to explore the museum in which their exhibits are to be set up, see the reactor and isotopes being separated, and visit biological and electro-technical laboratories as well as TVA's Norris Dam. Upon arrival, each will be presented with a rainbow-ribboned gold and silver National Science Fair medal.

Famed scientists, now working in the laboratories at Oak Ridge, decide who will win the more than \$1,000 in awards to be made to the boys and girls with winning exhibits in the various categories.

Four first "wish awards," valued at \$125 each, will be given. These prizes allow the winners to receive the scientific equipment they desire. There are also four second place "wish awards," valued at \$75 each, and four third place awards, valued at \$50.

Only those boys and girls attending classes in the last three years of a secondary

school, whose exhibits have won highest honors in area selections, come to the National Science Fair.

The National Science Fair is an effort to seek out potential scientists and engineers among the nation's youngsters, and to encourage as many of them as possible to secure their advanced training. The National Science Fair is conducted by Science Clubs of America, administered by SCIENCE SERVICE.

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TAXONOMY

Forest Service Lists 1,035 Tree Types in U. S.

► DISCOVERY OF a new species of ash tree restricted to a narrow Arizona Canyon has brought the "official" list of tree types from the United States and Alaska to 1,035.

The new tree, named the Goodding ash, *Fraxinus gooddingii*, in honor of its discoverer, botanist Leslie N. Goodding, is the 873rd distinct tree species listed by the U. S. Forest Service. In addition, there are 61 different varieties and 101 hybrids to complete the total.

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ELECTRONICS

"Electronic Scheduler" To Eliminate Bottlenecks

► THE BASIC design for an "electronic scheduler" has been developed at the University of California at Los Angeles.

It would anticipate manufacturing bottlenecks from an hour to as much as two months before they occur, and is said to be one of the most important advances in scientific production scheduling in 30 years.

"This conception is a major contribution to the technical know-how necessary for tomorrow's push-button factory," said Dr. Melvin E. Salvesson, director of U.C.L.A.'s Industrial Logistics Research Project, which is financed by the Office of Naval Research. "It promises to be one of the most important advances in scientific production scheduling in 30 years."

Basic design of the "electronic scheduling computer" was worked out by Richard G. Canning, electronics engineer on the project, who developed plans for such a computer after an intensive study with Dr. Salvesson of a 1,000-employee plant in the Los Angeles area.

Using electronic components, most of which are already commercially available, the two men say they can assemble a scheduling system that virtually will eliminate the need for expeditors in factories.

The two men estimate installing such a system in the plant they studied would cost about \$250,000 but add that it would pay for itself in clerical savings alone within three years. Savings from more efficient production, they believe, would amount to from three to ten percent of the factory's annual product, depending on the plant.

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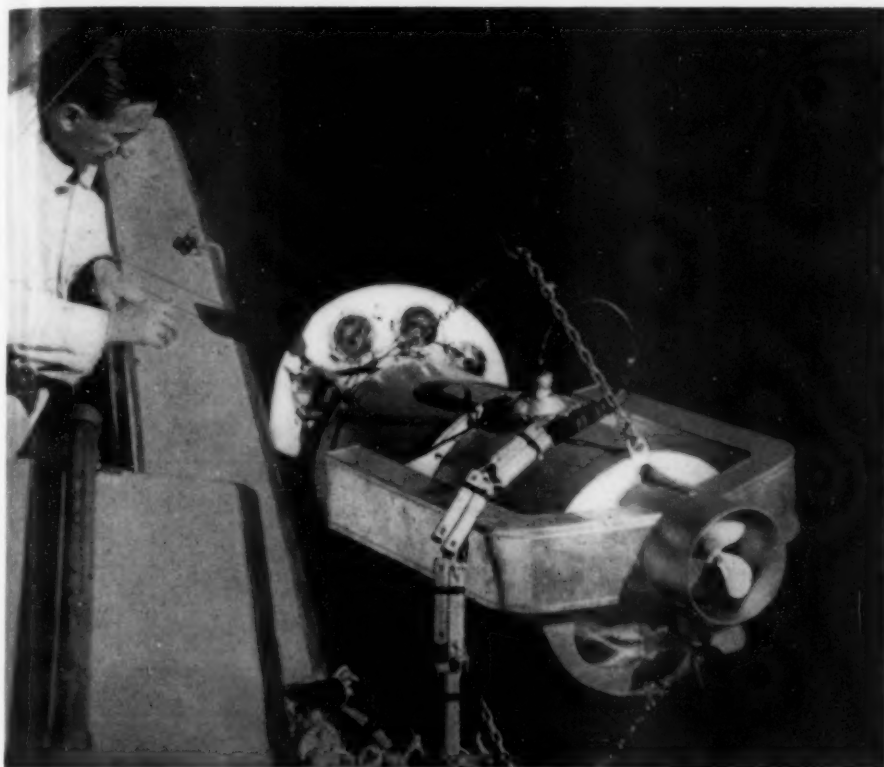
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UNDERWATER TELEVISION—For spying on fish 100 feet below the surface of Lake Minnewanka, Canada, scientists are using this lightweight TV camera.

ICHTHYOLOGY

Use TV to Spy on Fish

Canadian scientists have successfully used underwater television to study fish life. Apparatus, weighing only 300 pounds, has shown trout eggs to depth of 80 feet.

► **UNDERWATER TELEVISION** has been successfully used to study fish life and habitats 100 feet below the surface of a Canadian lake, Drs. J. P. Cuerrier, F. H. Schultz and V. E. F. Solman of the Canadian Wildlife Service report.

"The possible uses for underwater television in freshwater fisheries research are bounded only by one's imagination," Dr. Cuerrier said at the North American Wildlife Conference in Washington.

The apparatus used to televise the bottom of Lake Minnewanka was based on a large British underwater TV set used to locate the sunken submarine Affray in 1951.

The Canadian set weighs 300 pounds to the British model's almost half a ton. It is three feet long and one and one-half feet in diameter. Four sealed-beam spotlights furnish light in the murky depths. A half-inch plate glass window covers an opening in the front of the cylinder from which the TV camera lenses peer out.

The camera has two interchangeable

lenses, handled by remote control from the mother ship. Focusing and light are also done by remote control. Two propellers guide the cylinder backwards and forwards, as well as at an angle. A 500-foot coaxial cable connects the camera with the screen aboard the motor launch.

The first scientific result from TV exploration of Lake Minnewanka's depths, Dr. Cuerrier said, was to solve the problem of how deep the lake's trout spawn. The TV screen showed trout eggs to a depth of 80 feet.

Fish experts believed the lake's bottom had become covered with sand and gravel, destroying natural habitats of small fish. But a look at the bottom with underwater TV showed immediately that this is not the case.

Further examination of the lake depths revealed the distribution of bottom life. This would not have been possible by any other method, Dr. Cuerrier said.

Science News Letter, March 21, 1953

BIOLOGY

Bigger Vaccine Supply By Radiation Treatment

► **BIGGER SUPPLIES** of vaccine for typhus fever and possibly for virus diseases such as influenza may be obtained through radiation treatment of the germs as they grow on fertile hen's eggs.

This possibility is suggested by Dr. Donald Greiff of Saint Louis University, St. Louis, Mo.

The rate of growth of typhus germs on fertile eggs can be increased by radiation treatment, he reported to Phi Sigma, biology society, at Marquette University, Milwaukee. This increased growth should give more material for vaccine production.

Treatment with certain antibiotics, on the other hand, checked the growth of the germs.

Science News Letter, March 21, 1953

CHEMISTRY

Ceramic Fuel Forecast For Nuclear Power Plant

► **POWER PLANTS** of the future whose atomic fires are fed by ceramic materials and cooled by liquid metals have been forecast by Dr. L. R. McCreight of the Knolls Atomic Power Laboratory of Schenectady, N. Y.

Speaking before the American Chemical Society meeting in Los Angeles, Dr. McCreight stated that atomic reactors run to produce power for industrial use may develop such high temperatures that metal parts may need ceramic coatings to keep them from melting, and that ceramics are being studied for other uses, including fuel.

From these hints given in the paper, further developments may be suggested.

Classed as the most fire-resistant substances, ceramics would be the opposite of fuels from the conventional viewpoint. They represent metals which have already combined with all the oxygen they are capable of taking up. Nuclear fuels, however, do not operate on the principle of chemical combination, and thorium, at least, among possible nuclear fuels, is known to occur in the form of the refractory oxide. Economical use of such materials is seemingly under study in the development of a reactor which will produce useful power.

Science News Letter, March 21, 1953

INVENTION

Driver Training Device Keeps Auto in One Spot

► **A PLATFORM** to hold an automobile in one place while someone is learning to drive has been invented. Rollers hold the wheels while they are in motion and being turned by the student. Victor A. Wilson, Toronto, Can., received patent number 2,627,674.

Science News Letter, March 21, 1953

OCEANOGRAPHY

Mysterious Heat Flow Warms Deep Ocean Floor

See Front Cover

► OCEANOGRAPHERS RETURNING from a voyage of exploration in the South Seas are all warmed up about a mysterious heat flow on the ocean's floor.

Dr. Roger Revelle, director of the Scripps Institution of Oceanography's Capricorn expedition to the South Pacific, said the oceanographers found a heat flow from the ocean bottom equal to that from high and dry continents caused by radioactive elements.

As there is little radioactive material in the ocean floor, Dr. Revelle speculated, it may be that uranium is still in the earth's mantle deep below the ocean floor. Heat from the uranium may slowly percolate up through the mantle, thus warming the ocean floor.

This heat may account for a curious lack of sediments on the ocean floor, he said. The expedition found that sediments on the bottom were only about 600 feet deep, accounting for only 100,000,000 years of the earth's history.

The heat from the earth's mantle, rising to the ocean floor, may have destroyed the sediment's of the rest of the earth's 3,000,000,000-year history, he suggested.

When the Scripps' oceanographers were not sampling the ocean depths with seismic recorders, thermometers, dredges and other instruments, they donned diving masks to examine the underwater life of shallower areas, as shown on the cover of this week's SCIENCE NEWS LETTER. The scientists spent an estimated 75 man-hours skin-diving, the Institution reported.

Science News Letter, March 21, 1953

PUBLIC HEALTH

Jamaica Canned Plant Barred as Dangerous

► SOME UNSUSPECTING Americans have just been saved from ackee poisoning, known also as "the dreaded vomiting sickness of Jamaica."

They are those who might have bought and eaten some canned ackee, either out of curiosity to taste a new, strange food or because they liked the ackee's nut-flavored, white spongy arilli they ate on a visit to the West Indies.

The first shipment of canned ackee offered for entry to the United States, however, was found to consist of "flat sours." So the U. S. Food and Drug Administration refused it entry and ordered the shipment re-exported. Then FDA did a little checking on this strange food and said, in effect, no canned ackee can be imported into this country for sale.

The reason is that the ackee is only edible when fresh and ripe. Overripe or under ripe, it is poisonous. Since 1886, 5,000

deaths in Jamaica have been attributed to ackee poisoning. There is no way of telling poisonous from nonpoisonous arilli unless you know the condition of the ackee when gathered. In commercial cannery practice, ackees would have to come from widely scattered, indiscriminate sources. This, Food and Drug decided, would involve risk of including ackees unfit for consumption.

The ackee is a tropical tree belonging to the soapberry family. It is native to tropical West Africa and was brought to the West Indies in 1778. It grows 35 to 40 feet high. The fruit is a triangular capsule about three inches long and straw colored to magenta red. Inside is the white fleshy or spongy substance, said to resemble calf brain, called the arillus. According to one authority, the arillus is a "delicious morsel" when fried in butter and "excellent boiled with salt fish."

Science News Letter, March 21, 1953

MEDICINE

Blood Prints Distinctive As Human Fingerprints

► EXISTENCE OF "blood prints" that are almost as distinctive as fingerprints has been announced by the American Cancer Society in Boston.

The "blood prints" are electrophoretic blood patterns, that is, patterns of the migration of colloidal particles in blood plasma under the influence of an electric field.

Study of these patterns for hundreds of healthy and sick people shows a specific picture for each, Dr. Peter Bernfeld of Tufts Medical College, Boston, finds. The blood prints, unlike fingerprints, change a little from time to time, reflecting changes in health or a drastic change in diet, Dr. Bernfeld says.

Blood prints of identical twins are especially interesting to Dr. Bernfeld right now, and he will gladly run one for them if they go to his laboratory.

More than half those he has studied so far show striking similarity, though sickness, fever, nutrition and medicines make some differences.

Science News Letter, March 21, 1953

MEDICINE

New TB Medicine From Kalamazoo Soil

► THE SOIL near Kalamazoo, Mich., has yielded a new antibiotic chemical that may prove of benefit to tuberculosis patients.

Although less effective than streptomycin sulfate against TB germs in mice, the new antibiotic does not seem to cause damage to the nerve of hearing.

The new antibiotic, now undergoing clinical tests, is called Amicetin. Its discovery is announced by C. DeBoer, E. Louis Caron and Dr. J. W. Hinman of the Upjohn Company, Kalamazoo, in the *Journal of the American Chemical Society* (Jan. 20).

Science News Letter, March 21, 1953

IN SCIENCE

GENERAL SCIENCE

Saucers Blamed on Foam From Detergents

► RUMORS ABOUT flying saucers are flying through the air with the ease of a soap bubble.

The staid and sober British medical publication, *Lancet* (Feb. 21), in an article on detergents, says that detergents have caused some flying saucer stories in America.

Here is the way it goes: Municipal sewage plants are clogged, especially on Tuesdays, with detergent-laden laundry water. The agitation in the aeration tanks produces a layer of foam, sometimes six feet deep on top of the sewage tanks. Strong winds can whip masses of foam up into the air. The foam sails away to be identified by the populace as another flying saucer.

Science News Letter, March 21, 1953

GENERAL SCIENCE

Research Ship Outfitted For Gulf Explorations

► ABOUT \$100,000 worth of electronic equipment for research purposes will be installed on a three-masted auxiliary schooner, the Atlantic, in the Gulf of Galveston, soon.

Given to the Texas A. & M. Research Foundation by Erwin C. and Robert A. Uilein, Milwaukee industrialists, the schooner, formerly a sub-chaser and luxury yacht, will be used in research by the department of oceanography at Texas A. and M. College, College Station.

Research equipment to be mounted on the vessel includes an electronics laboratory, chemical, biological and physical laboratories, a fathometer, Loran, a geomagnetic-electrokinetograph, sampling equipment and machinery for dredging and coring the bottom of the Gulf of Mexico. It also will carry a Class A weather station for ships.

The Research Foundation is a non-profit corporation with headquarters on the Texas A. and M. campus. It conducts studies in many fields, using staff and facilities of the college as well as its own.

The Research Foundation directed research on laying of the longest known offshore pipeline in the Gulf of Mexico, and handled research on oyster mortality affecting the multi-million dollar oyster harvesting industry on the Gulf coast.

Increasing interest in the oil and gas reserves of the coastal tidelands has raised many questions of undersea conditions and the effects of waves upon offshore drilling structures and pipelines.

Science News Letter, March 21, 1953

MEDICINE

Radical Design

► RADICAL design for a new stroy t

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BIOCHEMISTRY

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NE FIELDS

MEDICINE

Radio Gold for Cancer Destroys Bone Marrow

► **RADIOACTIVE COLLOIDAL** gold, widely used in cancer treatment, can destroy the bone marrow.

A warning on "this hazard to the blood-forming tissues of the body" is issued by Drs. Thomas W. Botsford, H. Brownell Wheeler, Robert A. Newton and William E. Jaques of Peter Bent Brigham Hospital and Harvard Medical School, Boston, in the *Journal of the American Medical Association* (March 7).

They discovered the danger in autopsy examinations of four patients who had been getting this treatment. Particles consistent with colloidal gold were found in the damaged bone marrow of these patients. The marrow destruction, the doctors think, was due to radiation from the gold particles that were carried from the site of injection to the bone marrow.

The benefits of radioactive colloidal gold treatment may outweigh the dangers, as is the case with nitrogen mustard and some other anti-tumor drugs that damage bone marrow. But, the doctors point out, more experimental data and clinical appraisal will be necessary to determine this.

Science News Letter, March 21, 1953

BIOCHEMISTRY

Morphine Antidote Seen Aid in Mental Sickness

► **PSYCHIATRISTS PROBING** sick minds to find the cause of their sickness have a new aid. It is a chemical derived from morphine. It has the chemical name of N-allylnormorphine and the trade name, Nalline.

Nalline's potential value in psychiatry was discovered accidentally by Drs. Maurice Bornstein and Leon Yorburg of Brooklyn, N. Y., and Dr. Barbara Johnston of New York.

This drug is an antidote to overdoses of morphine and certain other pain-relieving drugs. It was being used to save two patients who had got too much of one of these drugs, Dromoran, or methorphan hydrobromide.

In both cases the patients, while still unconscious but beginning to recover, talked freely. One talked about people who wanted "to get my money." She claimed the doctors were experimenting on her and tore her way out of the oxygen tent.

The other said she knew she was going to die "but it didn't matter because no one wanted her except her husband."

The first patient later said, "Doctor, I'm sorry, but that's what I believed," referring to her talk about being experimented on.

Neither of these patients was mentally sick. But their reactions show that Nalline will bring unpleasant or painful ideas and memories to the fore against the patient's will and without any probing by the doctor, such as is necessary when pentobarbital sodium is used to release unpleasant memories buried in the patient's unconscious mind.

The cases are reported in the *Journal of the American Medical Association* (March 14) with the suggestion that further study be made of Nalline as a potential aid in psychiatric treatment.

Science News Letter, March 21, 1953

MARINE BIOLOGY

Sardine and Mackerel Catches Dangerously Low

► **SPECTACULAR FAILURE** of two California commercial fish species, sardines and Pacific mackerel, is creating real alarm among fishermen and fisheries scientists, Dr. John E. Fitch of the California Department of Fish and Game told the North American Wildlife Conference in Washington.

Catches of Pacific mackerel have dropped steadily from 146,000,000 pounds in the 1935-36 season to scarcely 20,000,000 pounds in the current season. Similar sharp decreases have occurred in the catch of sardines, one of California's most valuable species.

The biggest headache of fish conservationists, Dr. Fitch said, is how to build up the population of the declining species so there will be an adequate spawning stock for future generations.

The reserve spawning stock of Pacific mackerel, fish over four years of age, has dwindled to less than three percent of the population, Dr. Fitch said.

What is responsible for the failure of the fish to maintain their numbers—man or nature?

The part man plays in reducing the number of fish with his nets is only one of countless factors that could account for declining populations. Decrease in the fishes' food supply, changes of temperature or salt concentration in the water, an increase in the number of diseases, parasites or predators on the species could explain a decline.

However, Dr. Fitch said, man cannot yet control these natural factors. He can, however, exert some control over how and how much fishermen take from the sea.

Closed seasons and size restrictions might help the situation somewhat, Dr. Fitch said, but these alone cannot be expected to restore the species to their former abundance.

Perhaps the best thing that can be done, he said, is to place an over-all yearly bag limit on the amount of the fish that can be caught—and hope the spawning reserve can catch up.

Science News Letter, March 21, 1953

PSYCHOLOGY

\$200,000 to Find Why Some Families Fail

► **WHEN MEN** and women with excessive emotional needs marry, they and their families are likely to "fail so miserably that their problems require the major part of our health and welfare dollars and services."

This finding from a pilot study of 100 badly disorganized families will be further tested in a four-year study by Community Research Associates, Inc., New York, under a \$200,000 grant from the Louis W. and Maud Hill Family Foundation, which will be directed by Paul T. Beisser, associate director of Community Research Associates.

The pilot study showed 10 typical axes, or seesaws, on which most disorganized families are found. These are: 1. a dual immature dependency axis; 2. a woman-oriented anxiety axis; 3. a woman-dominated dependency axis; 4. a woman-dominated competitive axis; 5. a man-dominated competitive axis; 6. a man-oriented self-depreciating axis; 7. a woman-oriented self-depreciating axis; 8. a dual emotionally detached axis; 9. a man-dominated hostile axis and 10. a woman-dominated hostile axis.

The personality components which affect the marital axes include the passive dependent men and women, anxious adequate women, controlling dependent women, controlling belittling men and women, pain-seeking, long-suffering men and women, detached ineffectual men and women, hostile aggressive men and women, vulnerable susceptible partners, and troublesome ineffectual partners. It is the way these components "mix" in marriage and the degree to which the partners' emotional needs are excessive that damage the relationships of the whole family.

Science News Letter, March 21, 1953

TECHNOLOGY

Stoplight Watches Cars To Direct Traffic Flow

► **NOW** A smart stoplight has been invented. It watches cars coming toward it at intersections and keeps the green light burning longer when traffic gets heavy on one of the streets.

Through special detectors buried under the pavement near the intersection, the device, developed by General Electric engineers at Lynn, Mass., studies traffic flow on the streets. When traffic gets heavier on one of the streets, the detectors electronically tell the stoplight to keep traffic moving longer on that street.

The smart stoplight should reduce traffic problems at critical intersections where traffic often is spasmodic and difficult to predict. But it is any man's guess what happens at quitting time when cars come honking up both streets at once, bumper to bumper.

Science News Letter, March 21, 1953

HORTICULTURE

Dwarf Trees for Orchards

New developments in dwarfing fruit trees mean that suburban homes can have an orchard with a large variety of fruits. Forty dwarf apple trees grow in place of four standards.

By HORACE LOFTIN

► LIKE SNOW WHITE'S seven dwarfs, dwarf fruit trees never grow up. This is why they are important to the home gardener.

The development of dwarfed varieties of fruit trees has made it possible for any suburban dweller with a small plot of land to have his own orchard of apples, pears, peaches, plums and sweet cherries. An area 30 by 30 feet is now enough to raise all these fruits an average family may preserve, can and consume conveniently in a year.

And if there is not that much room available, dwarf fruit trees can be trained to grow along walls and fences, adding decoration as well as tasty fruits to the home.

A dwarf fruit tree is made by grafting the bud of a standard fruit tree to a rootstock of a dwarfing variety that does not yield a desirable kind of fruit. As the rootstock determines the size of the tree and the grafted bud the nature of the fruit, it is possible to juggle fruit trees around until you get a dwarf variety of almost any standard fruit you like.

Of course, there are many practical difficulties to overcome before a satisfactory dwarf is obtained. The chief trouble comes in the selection of a proper rootstock. Many that otherwise would make excellent dwarfing stock have a tendency to throw up suckers from the roots, develop a weak root system or lack hardiness in cold climates.

Develop New Varieties

Other rootstocks make trees that are too small to support the weight of the fruit. Sometimes a rootstock and the standard bud can not be grafted together directly. Then a third kind of fruit must first be grafted to the rootstock, and the standard bud later grafted onto it.

Plant scientists and commercial nurserymen are constantly working to produce better dwarf fruit trees. Just recently, Dr. Karl Sax of the Bussey Institution, Harvard University, announced the development of new dwarf peaches, plums and sweet cherries that are sturdier and more practical than any produced up to now.

Although dwarfs of these stone fruits have been known and used before, they all somehow fell short of the needs for hardiness, size, flavor of fruit, or commercial considerations. Dr. Sax believes the new dwarfs will fill the bill better to make these fruits practical for home orchardists.

The new dwarf stone fruit trees differ from the old ones by the kinds of rootstock

used. Standard varieties of peaches and plums, budded on a rootstock of the dwarf flowering almond or the Nanking cherry, bore fruit on the second year's growth. A sweet cherry dwarf was made by budding with the beach plum, but it has not been tested long enough to be sure how it will behave in later years.

Apples and pears have been dwarfed successfully for hundreds of years in Europe, where lack of space made smallness of fruit trees almost the first thing to be considered in an orchard. As a result, apple and pear rootstocks for dwarfing have long been standardized, and are available at commercial nurseries along with ready-prepared dwarf trees. One of the most popular apple rootstocks is the "Malling IV."

In this country the dwarfing effect on apples is produced by using Malling IV or Malling VIII as an interstock. Such trees consist of three sections—a seedling root and a short stem section, about six inches of dwarfing interstock, and on top of this the commercial variety.

Pears are usually dwarfed by grafting on quince rootstocks, but different dwarfing



DWARF TREE — Dr. Karl Sax towers over an extreme dwarf which is less than three feet tall and bears two large Cortland apples.

stocks are currently being tested at the Bussey Institution.

An interesting and attractive variation of the dwarf fruit tree is the "espalier," or ornamental dwarf. Espaliers are dwarf fruit trees that have been trained to grow against walls, fences, and trellises. By controlled pruning, bending and tying back, these trees can be made to grow flat against a wall, U-shaped, Y-shaped, palm-like and in other beautiful designs.

Espaliers Are Popular

Espaliers are very popular in Europe where they have long served the double function of providing food and decoration. Many of the famous old-world gardens feature espalier fruit trees against ancient walls and buildings. The "Belgian fence" is made of criss-crossed Y-shaped espaliers grown in a row.

It takes about six years to train an espalier dwarf. For this reason, most home orchardists prefer to buy them from commercial nurserymen after at least three or four years training. Many large nurseries have them on hand or can supply them.

The varieties of dwarf apple trees that are readily available at commercial nurseries are amazing. There are, to name a few, Cortland, Golden Delicious, Melba, McIntosh, Macoun, Jonathan and Stayman types that are excellent for eating out of hand or for salads. For cooking, there are dwarfs of Crimson Beauty, Duchess, Gallia and Baldwin.

Dwarf pears on the market are Bartlett, Gorham, Conference, Dana Hovey, Bosc and Winter Nelis, all calculated to make your mouth water.

Remember that it is only the size of the tree that is dwarfed; the fruits are as large and tasty as on the standard tree.

Space-Saving Advantage

What are the advantages of dwarf fruit trees for the home gardener? The answer is clear when you consider that 40 dwarf apple trees can be grown in the space necessary for only four standard apple trees. Besides occupying less ground space, dwarf fruit trees are shorter, usually from five to seven feet tall. This means they can be pruned more easily, sprayed or dusted with simple equipment, and so given more individual care. As a result the fruit is often larger than on standard trees. Fruits from dwarfs are easier to harvest and there is less spoilage from fallen fruit.

Another important point is that dwarfs usually begin fruiting sooner than standard trees. Dwarf apples, for instance, usually bear fruit within a couple of years, while standard apples may take from five to ten years before they bear. And you can get

more space.

But advantage

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more varieties of apples into the allotted space.

But dwarf fruit trees have their disadvantages, too.

Dwarf trees are more expensive than standard trees. Young dwarfs cost up to twice as much as standard trees at commercial nurseries. This is a greater difference than it seems at first sight, because more trees on the same plot of land mean more money put out. To illustrate, four standard apples grow in the same space needed for 40 dwarfs. If the standard apple trees cost \$1 each, you would invest \$4 in trees to plant the area. But to plant the same ground in dwarf apples at \$2 each would cost \$80!

Dwarfs require more personal attention than the sturdy standards. Very often their root systems are not strong enough to hold up the weight of limbs, and artificial supports are needed. And dwarf varieties are generally shorter-lived than standard fruit trees.

However, most of these objections are important only to the commercial orchardist. The average home grower will have no need for such large numbers of trees that expense becomes prohibitive. Neither will the question of care prove a burden, because the only garden hobbyists that succeed in growing anything anyway, from petunias to oak trees, are those with time and interest to tend their gardens properly.

Directions for Grafting

Most authorities will recommend that you start out with dwarf fruit trees already developed in a commercial nursery. But if you are dead set on doing your own grafting, here are a few elementary principles.

Choose a good dwarfing rootstock. This is of the greatest importance, as the success or failure of the dwarf tree depends on this selection to a great extent. Your nurseryman or state agriculture department can advise you where and how to find the right rootstock.

Buds should be grafted in late July or August. Make a T-shaped cut into the rootstock bark about four inches above the ground. Meanwhile, prepare a bud shield by slicing off a small piece of bark containing a bud from the juncture of a leaf stem of the standard fruit you want. Then slip

this bud shield into the T-cut, and bind the wound with raffia, string or rubber bands to hold the two parts in close contact. The ties can be cut away in 10 days.

Next spring, just before growth will start, cut off all the rootstock above the grafted bud shield. This gives the bud all the growing force of the plant, and it should sprout vigorously in a little while. Make sure that any growths from the rootstock are cut back.

The following spring before growth starts, prune back the branches of the new dwarf tree and transplant it to the orchard if it looks strong enough.

From this stage on, whether you yourself raised it this far or whether you bought your plant, just keep your dwarf tree pruned, thinned, properly supported and mulched, and sprayed—and get a bushel basket ready for your home harvest.

Science News Letter, March 21, 1953

BIOCHEMISTRY

Fat Chemical Protects From A-Bomb Radiation

► PROTECTION AGAINST damage by radiation from X-rays to atom bombs is given by a chemical found in fats. The chemical is linoleic acid.

Discovery of its ability to protect against radiation damage, in rats at least, was made by Drs. Harry J. Deuel, Jr., Amber L. S. Cheng, George D. Kryder and M. E. Bingham of the University of Southern California, Los Angeles, in research supported in part by the Atomic Energy Commission.

A very small amount of this chemical taken daily enabled male rats exposed to damaging amounts of X-rays to survive for an average of 74 days, compared to a 53-day average survival time for rats without the fatty acid. The female rats survived an average of 74 days with the fatty acid, compared to 58 days without.

The differences are even more significant because the rats given the fatty acid got bigger doses of X-rays than the ones without the fatty acid. The male rats had 45% greater exposure to the X-rays and the females 17% greater.

The experiment was stopped at the end of 14 weeks. The protective effect of the linoleic acid would have shown up as even greater if the experiment had gone on longer, the scientists say. At the end of the 14 weeks, only eight out of the 71 rats in the non-fatty acid group survived, compared to 30 out of 72 in the group that got the fatty acid.

Why this fatty acid protected the rats against radiation is not now clear, the scientists state in *Science* (March 6). But they point out that this and a number of other substances that have proved effective in protecting against radiation damage are substances of considerable importance in nourishing the skin and keeping it in good condition. The other substances are cystine, ascorbic acid, or vitamin C, and vitamin P.

Science News Letter, March 21, 1953

RADIO ASTRONOMY

Meteor Trails Miles Long in Upper Air

► METEORS LEAVE trails behind them, when they enter our atmosphere, some 15 to 18 miles long.

The length of these columns of ionized air, only a few yards in diameter, has been measured through the use of two radio telescopes, one on the Stanford University campus, and another 60 miles away at Turlock, Calif. In all, more than 1,700 meteors were detected in a five-and-a-half-hour period and used for measuring purposes. Calculations, reported in the *Transactions, American Geophysical Union* (Feb.), showed that only 73 of these meteors could be said to have produced echoes at both stations, however.

From comparing the echoes from the two stations, L. A. Manning, O. G. Villard, Jr., and A. M. Peterson of Stanford were able to show that the mean length of the meteor trails was between 15 and 18 miles, and that some trails were probably as long as 30 miles. Their measurements were made at 23 megacycles.

Science News Letter, March 21, 1953



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By NORMAN FORD

Unfortunately, it's not easy to shop around for real travel values—for many of the best low cost vacations never are advertised. Yet the secret of guaranteeing a new, different and exciting vacation is to learn the hundreds of things you can do and the places you can visit on the money you want to spend.

I've spent months doing nothing else than travel around to find the best vacation bargains in all North America. I have found low cost summer paradises; have learned scores of ways to save and can tell you about the vacation-out-of-the-ordinary that is just what you've been looking for.

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Here is a sampling of different vacations . . .

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANNUALS FOR EVERY GARDEN: The ABC's of Flowers from Seed—Dorothy H. Jenkins—Barrows, 3rd ed., 223 p., illus., \$3.00. Aids in the selection of annual flowers, where to plant and how to grow them.

BIOLOGICAL CHEMISTRY: An Introduction to Biochemistry—Alexander Gero—Blakiston, 340 p., illus., \$5.00. Intended to bridge the gap between the standard one-year college organic chemistry course and physiological chemistry in medical school.

CHEMICAL ANALYSIS OF INDUSTRIAL SOLVENTS—Morris B. Jacobs and Leopold Scheffan—Interscience, 501 p., illus., \$10.00. Covers the assay, the analysis of mixtures and the identification of an unknown solvent or mixture.

CLASSIFICATION OF FLAX VARIETIES, 1946—A. C. Dillman—Govt. Printing Office, USDA Tech. Bul. No. 1064, 56 p., illus., paper, 45 cents. Plant characters that can be used to distinguish 62 varieties.

THE COMPLETE BOOK OF DOG CARE—Leon F. Whitney — Doubleday, 383 p., illus., \$3.95. Covers all phases of keeping a dog.

DIGGING BEYOND THE TIGRIS: An American Woman Archeologist's Story of Life on a "Dig" in the Kurdish Hills of Iraq—Linda Braidwood—Schuman, 297 p., illus., \$4.50. Excavations at Jarmo obtained evidence of the change from cave-dwelling savagery to the establishment of settled villages of farmers and herdsmen.

DJANGGAWUL: An Aboriginal Religious Cult of North-Eastern Arnhem Land—Ronald M. Berndt—Philosophical Library, 320 p., illus., \$7.50. Arnhem Land is today an aboriginal reserve in the northern territory of Australia.

FLOWER ARRANGEMENT WORKBOOK 1—Myra J. Brooks—Barrows, 64 p., illus., spiral \$2.00, cloth \$2.50.

FREEDOM AND AUTHORITY IN OUR TIME: Twelfth Symposium of the Conference on Science, Philosophy and Religion—Lyman Bryson et al., Eds.—Harper, 767 p., \$6.00. Papers presented at the Symposium held at Columbia University, Sept. 4-7, 1951.

GLOXINIAS: And How to Grow Them—Peggie Schulz—Barrows, 128 p., illus., \$2.95.

GLYCEROL—Carl S. Miner and N. N. Dalton, Eds.—Reinhold, 460 p., illus., \$12.00. Complete information on the sources, recovery, refining and uses.

THE JUNIOR BOOK OF INSECTS: Interesting Facts About the Lives and Habits of the Common Insects Together with Simple Instructions for Collecting, Rearing, and Studying Them—Edwin W. Teale—Dutton, rev. ed., 249 p., illus., \$3.75.

LIVING THINGS—Frederick L. Fitzpatrick and Thomas D. Bain—Holt, 415 p., illus., \$3.60. A text for secondary schools.

MOMENTS OF PERSONAL DISCOVERY—R. M. MacIver, Ed.—Harper, 170 p., \$2.00. Leaders in the arts, sciences and religion like Harlow Shapley, Margaret Mead and Harry E. Fosdick tell of the turning points in their lives.

THE NATURE AND SIGNIFICANCE OF THE ANTI-BODY RESPONSE—A. M. Pappenheimer, Jr., Ed.—Columbia, 227 p., illus., \$5.00. Papers before the symposia on microbiology at the New York Academy of Medicine, March 21-22, 1951.

THE NEW OFFICIAL GUN BOOK, 1953-54—Charles R. Jacobs, Ed.—Crown, 4th ed., 176 p., illus., paper \$1.50, cloth \$2.50.

PAGEANT OF THE ROSE—Jean Gordon—Studio-Crowell, 232 p., illus., \$5.00. Beautifully illustrated.

PERENNIALS FOR EVERY GARDEN—Helen Van Pelt Wilson—Barrows, 6th ed., 256 p., illus., \$3.95.

PHILOSOPHY AND PSYCHO-ANALYSIS—John Wisdom—Philosophical Library, 282 p., \$5.75. A group of journal articles by the professor of philosophy at the University of Cambridge.

POLYSACCHARIDE CHEMISTRY—Roy L. Whistler and Charles L. Smart—Academic Press, 493 p., illus., \$10.80.

THE PRINCIPLES OF LINE ILLUSTRATION: With Emphasis on the Requirements of Biological and other Scientific Workers—L. N. Staniland—Harvard, 212 p., illus., \$5.00. Emphasis is placed on aids to help the draftsman, although unskilled, produce accurate drawings.

RESIDENTIAL TREATMENT CENTERS FOR EMOTIONALLY DISTURBED CHILDREN—Children's Bureau, Federal Security Agency—Govt. Printing Office, 77 p., paper, 25 cents. A list of the private centers, together with a brief description of their services, staffs and facilities.

RICHES FROM THE EARTH—Carroll Lane Fenton and Mildred Adams Fenton—John Day, 159 p., illus., \$2.75. A book for boys and girls.

SCHOOL BUILDING COSTS—Building Research Advisory Board, National Research Council, 83 p., paper, 50 cents. Report on a working conference sponsored by the American Institute of

Architects, the U. S. Chamber of Commerce and the U. S. Office of Education.

SCIENCE AND HUMAN BEHAVIOR—B. F. Skinner—Macmillan, 461 p., \$4.00. Discusses the application of science to human behavior, and points out the conflict between such an application and the traditional philosophy of human behavior.

THE SEX LIFE OF WILD ANIMALS: A North American Study—Eugene Burns—Rinehart, 290 p., \$3.00.

SOME LARGE-LEAVED ORNAMENTAL PLANTS FOR THE TROPICS—Harold F. Winters—Govt. Printing Office, Fed. Expt. Sta. in Puerto Rico, USDA Cir. No. 35, 92 p., illus., paper, 35 cents.

VIRGINIA MINERAL RESOURCES—Byron N. Cooper and Richard V. Dietrich—Virginia Polytechnic Institute, 7 p., paper, \$1.00. Tells how Virginia ranks twelfth among the mineral producing states. A large map attached shows the location of deposits.

WAVES AND TIDES—R. C. H. Russell and Comdr. D. H. Macmillan—Philosophical Library, 348 p., illus., \$6.00. More accurate weather forecasting in the future is likely to come as the result of advances in the science of wave-forecasting. This is a technical book of especial interest to engineers.

THE WONDERFUL WORLD OF INSECTS—Albro Gaul—Rinehart, 290 p., illus., \$4.00. Covers the recent trends in insect behavior and physiology studies with a summary of the present knowledge of insects as parasites, friends and foes. Beautifully illustrated.

Science News Letter, March 21, 1953

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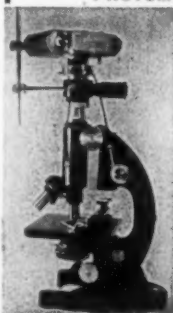
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PHYSICS

Reactor Produces Power

Useful amounts of electric power have now been produced by experimental homogeneous reactor at Oak Ridge National Laboratory. About 150 kilowatts were generated.

► THE PRODUCTION of useful amounts of electric power by nuclear energy has been achieved by successful operation of an experimental homogeneous reactor at Oak Ridge National Laboratory.

At 1 a.m. on Feb. 24, scientists brought a pilot model of the unique reactor system up to its full design power of 1,000 kilowatts of heat output. The reactor steam then was switched to a turbine-generator and about 150 kilowatts of electricity was produced.

This is enough electricity to meet the estimated needs of 50 average five-room dwellings, the Atomic Energy Commission says.

Although capable of producing both fissionable material and electric power, the small homogeneous reactor was not designed to produce economic electric power, and many problems in that field remain to be solved.

The demonstration of the feasibility of homogeneous liquid-fuel reactor systems is, however, an important milestone toward economical production of electricity by means of nuclear reactors.

The first demonstration of electric power production by a reactor occurred in December, 1951, at the National Reactor Test Station in Idaho with the operation of the experimental breeder reactor. (See SNL, Jan. 12, 1952, p. 24.)

In the homogeneous reactor, a single homogeneous solution serves as fuel, moderator and coolant. The heat generated by the nuclear reaction of the uranium fuel in the solution is removed by pumping the hot radioactive liquid through a heat exchanger, or boiler, which produces steam to drive a turbine-generator.

A homogeneous type reactor was built in 1944 at Los Alamos Scientific Laboratory in New Mexico, and another is nearing completion at North Carolina State College.

These units, however, are low-power research reactors. The one at Oak Ridge is the first to operate at a temperature and power high enough for production of steam to run a standard industrial turbine-generator.

Construction of this Oak Ridge reactor was started in March, 1951, following two years of development and design by Oak Ridge National Laboratory scientists. The reactor "went critical," or first achieved a nuclear chain reaction, on April 15, 1952. Following the low-power operation, the experimental work will continue at higher power to acquire information regarding the feasibility of this type for full-scale reactors.

Successful operation of the homogeneous reactor climaxed a two and one-half year effort by a group of scientists of Union Carbide and Carbon Corp., which operates the Oak Ridge Laboratory for the A.E.C.

Science News Letter, March 21, 1953

PHYSICS

X-Rays Not Bomb Trigger

► IT "JUST isn't possible" to set off an atomic bomb, or any other kind, by peering through it with X-rays, the Atomic Energy Commission says.

Neither does it appear that the United States has some cloak-and-dagger gadget that will explode an A-bomb in an enemy plane approaching this country.

When the United Nations bought a portable X-ray machine recently on the advice of a New York Police Department bomb expert, some observers wondered whether the X-rays might accidentally trigger a concealed bomb. The portable machine is to be used by U.N. guards to examine all packages brought to headquarters of the United Nations.

Bomb-piercing X-rays seem harmless enough when used on all known kinds of explosives, including nuclear explosives. To trigger an A-bomb, atomic particles called neutrons are needed.

X-rays are similar to light. They can be reflected, they can be bent as they dart at an angle through lenses and other materials, and they can be polarized like light. X-rays are much shorter in wavelength than light rays, and they have thousands of times more energy than light waves.

With their portable machine, U.N. guards may see the size and shape of objects brought there in sealed boxes. They also may be able to tell whether the object is made of wood or steel. But an X-ray ma-

Questions

BIOCHEMISTRY—How can a morphine antidote aid treatment of mentally sick? p. 185.

...

CHEMISTRY—What is "Suzie Q"? p. 180.

How could chlorophyll have been formed on a lifeless earth? p. 181.

...

HORTICULTURE—What are the advantages of dwarf fruit trees? p. 186.

...

GENERAL SCIENCE—How could detergents cause rumors of flying saucers? p. 184.

...

MARINE BIOLOGY—How can ultrasonic pulses track whales? p. 181.

...

MEDICINE—Can young women with heart disease have babies? p. 180.

...

Photographs: Cover, Scripps Institution of Oceanography; p. 179, Fremont Davis; p. 181, General Electric Company; p. 183, Canadian Wildlife Service; p. 186, Bussey Institution; p. 192, Ray Brown Automotive Co.

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chine will not tell the guards whether nuclear matter is inside the package.

Clicking Geiger counters could do that, however. The more radioactivity the counters detect, the more frantically the devices chatter to their operators.

But nuclear matter can be shielded by lead even from Geiger counters. Dr. J. Robert Oppenheimer, director of the Los Alamos laboratory at which the atomic bomb was perfected, once remarked that a screwdriver is the best tool to use when examining a package that might contain an A-bomb.

"Open the package and look at what's inside," he said in effect.

Other bombs, not of a nuclear type, do not depend upon neutrons to explode them. It takes something more familiar to do the trick, such as fire or a good stiff jolt.

Rumors are unfounded that have said from time to time the U. S. had some hush-hush gadget that can be aimed at an airplane to explode any A-bombs the plane might be carrying, the AEC reports. Radar will not trigger nuclear bombs.

And no Flash Gordon cosmic ray gun has yet been revealed that will disintegrate an object into a batch of miscellaneous atomic parts wandering around in space.

Science News Letter, March 21, 1953

The bomb bay of a modern heavy bomber has the capacity of two five-room houses.

PSYCHOLOGY

Psychological Warfare

Planning the strategy for cold war should include consultation with psychologists, sociologists, anthropologists and psychiatrists, Dr. Mark May urges.

► "THE GOVERNMENT should use the advice of professional psychologists in its psychological warfare strategy planning," Dr. Mark May, director of Yale's Institute of Human Relations, told SCIENCE SERVICE.

"So far as I know the psychological strategy board now has no one on it even resembling a psychologist," Dr. May, who is also chairman of the U. S. Advisory Commission on Information, said. "Professional psychologists, sociologists, anthropologists and psychiatrists should be consulted in planning the strategy of the cold war."

Dr. May had three other suggestions for improving our cold war strategy. First, he said, there should be one overall strategy designed for the cold war. Second, the lines of authority from those who plan to those who operate should be tightened. Third, a new operating agency, outside of the State Department, which combines all overseas information services in one unit should be set up.

C. D. Jackson, who has gone to the White House as President Eisenhower's adviser on psychological warfare, might well be planning such a major reorganization, Dr. May speculated.

Dr. May's information commission is required to report to Congress twice a year and to the State Department four times a year. It evaluates the world information job our government is doing. To this end, Dr. May has traveled over Europe, even going behind the Iron Curtain, on a diplomatic passport, to Warsaw and Prague.

Asked about the effectiveness of the Voice of America, now being investigated by Senator Joseph McCarthy (R-Wis.), Dr. May said:

"We are doing a terrific job behind the Iron Curtain. We have a wonderful audience. We have the Kremlin squirming. The proof of this is in the millions the Russians are spending in trying to jam our broadcasts and in the ill-tempered answers to them in Pravda and other Soviet publications. They wouldn't be hollering so loudly, if we weren't hurting."

Dr. May added that the Voice of America is able to place a great many programs on local radio stations in free Europe and that these are effective. He did not believe, however, that any shortwave broadcasts from here to western Europe would have much effect.

Senator McCarthy's investigation of the Voice of America, Dr. May said, "has raised a lot of havoc with morale, until now it is at an all-time low in this vital operation. At the same time," he went on, "I think Americans are getting a distorted picture of

the Voice from the televising of the investigations. The damage being done is probably far outweighing the good such an investigation might do."

Dr. May was asked about the effectiveness of the two messages President Eisenhower issued, one just before Stalin died directed at the Russian people and the other, formal official condolences when he died.

"Well, it looks as though our psychological warfare people were surprised with no plan ready," Dr. May said. "A plan of what to do when Stalin died should have been all prepared and stuck away in a drawer somewhere."

Dr. May said that the problem was too complicated to render a judgment as to whether the President said the right thing from a strategy point of view.

Science News Letter, March 21, 1953

MEDICINE

Bottleneck in G.G. For Polio Broken

► FIRST BREAK in the bottleneck of gamma globulin production for protection against polio paralysis next summer has come, Basil O'Connor, president of the National Foundation for Infantile Paralysis, announced in New York.

The break comes through arrangements between the Foundation and Armour and Company whereby Armour will increase its processing facilities for production of this blood fraction. Armour is one of the companies that has been processing blood fractions for the American Red Cross.

About 60,000 additional average doses of gamma globulin each month will be available for this summer as a result.

Science News Letter, March 21, 1953

NUTRITION

Do You Eat Like Cow? Need 12,500 Calories

► DO YOU eat like a cow?

Experiments by the U. S. Department of Agriculture show that a 400-pound calf uses 5,400 calories a day to maintain its weight. To gain about one and one-half pounds a day, a calf needs 12,500 calories.

Recommended daily allowances by the National Research Council for a moderately active woman, 123 pounds, call for 2,500 calories a day; for a moderately active man, 154 pounds, 3,000 calories.

Science News Letter, March 21, 1953

Do You Know?

It is possible to smell as little as one part of ozone in 10,000,000 parts of air.

Mechanical failures cause about 20% of the accidents that occur in industry; personal errors cause about 80%.

Well-cured concretes and mortars, like wine or cheese, definitely improve with age.

Two thin coats of clear shellac applied to lamp cords near the plug will keep the cords from fraying there so soon.

To make shirts last longer, turn up the collar of the soiled shirt before laundering and leave it up until the shirt is put on again fresh.

Science News Letter, March 21, 1953

VETERINARY MEDICINE

Anti-Arthritis Drugs Restore Shocked Dogs

► A DOG in shock after being hit by an automobile can be brought back to normal with the aid of ACTH or cortisone, Dr. Peter H. Forsham of the University of California Medical Center, San Francisco, says.

These two hormone drugs, widely known for their treatment of rheumatoid arthritis in humans, are also useful for relieving allergic rashes, asthma, and the swelling and inflammation of certain spider and snake bites.

They are useful in the same way, Dr. Forsham finds, for treating such conditions in animals.

Science News Letter, March 21, 1953

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☼ **HEMISPHERES MADE** of a clear plastic are placed over outdoor seedlings and protect young plants from light frost; heavy rains, hail and small animals. The protective hoods permit sunlight to stream through and do not screen out ultraviolet rays needed by the plants. The hemispheres are easily washed and can be reused.

Science News Letter, March 21, 1953

☼ **ALUMINUM SIDING**, adaptable to either modern or traditional house architecture, is easy to install so that its deep shadow lines run either horizontally or vertically. Resisting dents and unsightly waves and ripples, the clapboard siding is prepainted with a sprayed, baked finish that withstands the weather well.

Science News Letter, March 21, 1953

☼ **NEW PLANT food**, sprayed on the leaves of plants or added to the soil, supplies a "balanced diet of nitrogen, phosphorus, potassium and essential trace elements" to growing things, the manufacturer says. Soluble in water, the plant food makes an odorless spray that also can be used indoors on potted plants.

Science News Letter, March 21, 1953

☼ **SAFETY BELT** for automobiles, trucks and buses, as shown in the illustration, accommodates two persons at once and can



be fastened in about five seconds. Attached to the car chassis, the belt's webbing comes in various colors to blend with the car's color scheme.

Science News Letter, March 21, 1953

☼ **LIQUID LEAK detector** works in basketballs as well as in huge pressure tanks

of complex machinery. A fluorinated hydrocarbon, the liquid under pressure is colorless, virtually non-toxic and odorless. It changes to a gas after escaping through tiny leaks. An electronic device or gas-burning torch whose flame changes color when in contact with the gas reveals the location of the leak.

Science News Letter, March 21, 1953

☼ **CORNER BRACE** for window screens slips into a slot that is easily sawed into the corner of the wooden screen frame and "locks" the frame together. The corner clamp is held in position by eight tiny nails.

Science News Letter, March 21, 1953

☼ **STORAGE CONTAINER** holds three gallons of anti-freeze and should solve the problems of filling station attendants who are called upon by their customers to drain and store anti-freeze solutions. The plastic-lined, light-tight unit also can be used on picnics as an ice-cube carrier.

Science News Letter, March 21, 1953

☼ **SHUTOFF VALVE** for garden hoses permits water to run full-force yet shuts it off completely at the twist of the valve key. The brass valve is leakproof, the manufacturer states, and can be screwed into the hose line between couplings.

Science News Letter, March 21, 1953

• Nature Ramblings •

► **SPRING BIRD** songs have already filled the air where winter has retreated, and will soon be heard to the northern boundary and up the highest mountains.

There have been robins and red-winged blackbirds; presently there will be wrens and bluebirds, thrushes and orioles. The full choir will be the delight of children and poets, the distraction of lazy folk who like to sleep late.

Romanticists of all schools have for centuries rhapsodized over the sweet songs of birds, hailing them as "nature's troubadours" and all that sort of thing. Since many bird songs do sound very sweet to human ears, it is only natural for us to suppose that birds sing for the same reasons that we do: that they are feeling happy, or want to attract favorable attention to themselves, or are trying to please their friends or offspring. Such "anthropopsyching" is a mental groove very easy to slip into.

However, more objective observations made by cooler-brained field scientists seem to indicate that birds do not necessarily

Utilitarian Song



sing through sheer exuberance of feeling or from love of mate or family. Certainly the first song-outpourings we hear in spring cannot come from such causes, for neither families nor nests exist as yet, and even the prospective mates have not yet put in their appearance. First spring bird songs are sung only by males—and heard only by males.

The reason is highly utilitarian. Practically all song birds migrate in waves, with

the males traveling in advance of the females. Upon arriving at an area that promises to supply good hunting for the prospective nestlings, each male bird picks out a tract that will supply his family's needs.

Then he proceeds to stake claim to it by perching in some prominent place and singing as loudly as he can. However pleasant his song may sound to human ears, it is probably disagreeable to a later-coming male, for it warns him, in effect: "This territory is mine; move on or prepare to exchange buffets!"

Bird song as an expression of bird pugnaciousness reaches an easily observed climax when a cat gets near a wren-house. Between furious lunges at Tabby's bewildered head, the wren will perch on a twig and sing as if to burst his throat. And when the furred ogre has slunk away he will sing again, for as much as a half-hour.

Just like that larger and equally assertive though less tuneful male—the common rooster.

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